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Species of the Afrotropical genus *Ventrops* Crosskey (Diptera: Rhinophoridae)

by

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ABSTRACT

Three new species of *Ventrops* Crosskey, 1977 are described, viz., *V. hannemariae*, *V. intermedius*, and *V. incisus*. A broadened generic diagnosis is given, and the phylogenetic affinities of *Ventrops* are discussed.

INTRODUCTION

In his revision of the Afrotropical fauna of Rhinophoridae, Crosskey (1977) gave a detailed description of the genus *Ventrops* in which he included a single described species, *V. milichioides*, and an unidentified female probably representing an undescribed species. Since then, many specimens of *Ventrops* have been collected or sorted out from various collections, with several specimens representing undescribed species. Three of these new species are described below, and the generic diagnosis is broadened accordingly.

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Abbreviations for depositories are:

DZUT = Department of Zoology, University of Tel Aviv.
NMP = Natal Museum, Pietermaritzburg.
ZMUC = Zoological Museum, University of Copenhagen.

Genus *Ventrops* Crosskey

Ventrops Crosskey, 1977:20. Type-species: *Ventrops milichioides* Crosskey, 1977, by original designation.

Diagnosis. Colour black with small amounts of grey pollinosity, especially on anterior part of abdominal tergites. Abdomen sometimes totally apollinose. Head profile with eyes medium size to large, in latter case occupying almost entire side of head. Lower eye-margin at or distinctly below level of vibrissae, posterior eye-margin slightly or very conspicuously concave. Vibrissal angle distinctly recessive. Frons widening towards lunula, equibroad in both sexes, and with 2–4 unequal proclinate orbital bristles. Fronto-orbital plate broad, sparsely haired in addition to bristles, or bare. Parafacial plate narrow and densely setose, or reduced by

enlarged eye to a very narrow, bare strip. Antenna short, arista distinctly longer than third antennomere and short-haired to micropubescent or bare. Proboscis short, palpi of moderate length or distinctly shorter than width of prementum. Lower prostigmatic bristle well developed and proclinate. Wing vein M gently bent in a widely obtuse angle, cell r_{4+5} open. Basal node of vein R_{4+5} with 1 strong seta and 1–2 setulae. Costal spine short and distinct or almost undifferentiated. Abdomen without discal bristles. Male terminalia with cerci somewhat shorter than surstyli, or reduced and in lateral view almost concealed by the surstyli.

Key to species of *Ventrops* (males only)

1 Gena and parafacial plate almost obliterated by an enormously enlarged eye (Fig. 8). Acrophallus simple 2
— Gena and parafacial plate distinct. Acrophallus with median sclerotisation extending distinctly beyond phallotreme (Fig. 5) 3
2 Cerci small and rhomboid in posterior view (Fig. 10). ST5 distinctly incised at posterior margin (Figs 9, 12) ..... **incisus** sp. n.
— Cerci triangular in posterior view, with slender prongs (Fig. 15). ST5 evenly rounded or very slightly concave at posterior margin (Figs 16–17) ..... **milichioides** Crosskey
3 Gena 0,33 × eye height (Fig. 1). Basicosta yellow ..... **hannemariae** sp. n.
— Gena 0,18 × eye height (Fig. 7). Basicosta brown ..... **intermedius** sp. n.

Ventrops hannemariae sp. n.

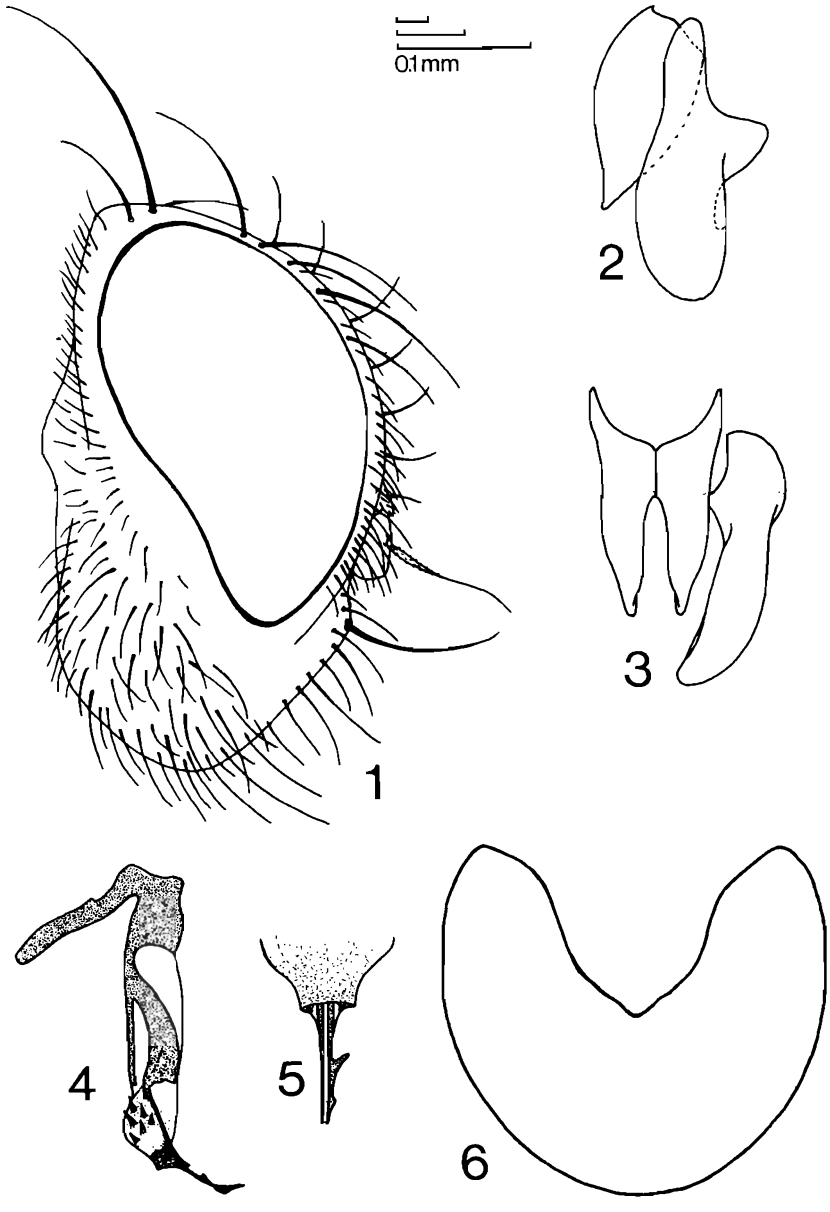
Figs 1–6

Derivation. Named for my wife.

Description. ♂. Head black with dark reddish frontal vitta and genal groove. Fronto-orbital plate and parafacial plate with thin grey pollinosity. Eye of medium size, with slightly concave hind margin. Ocellars, postocellars, and inner and outer verticals well developed. Fronto-orbital plate with 4 somewhat unequal proclinate and 1 reclinate orbital bristle, with a few additional setae at vertex, and densely setose in lower part. Parafacial plate densely setose almost to lower eye-margin. Antenna blackish brown, short; third antennomere 1,3 × as long as second. Arista 2,5 × as long as third antennomere, micropubescent at base, otherwise bare. Vibrissae well developed, situated about at level of lower eye-margin. Gena broad, 0,33 × eye height. Proboscis short, palpi shorter than width of prementum.

Thorax black with trace amounts of grey pollinosity on pleural sclerites. Chaetotaxy: *acr* = 0 + 1, *dc* = 2 + 3, *ia* = 0 + 2, *sa* = 1 + 2 (the pre-alar very weak), *h* = 2, *ph* = 1 (the median). Katepisternal bristles 1:1. Legs with claws 0,3–0,4 × as long as fifth tarsomere. Wings slightly fumose, basicosta yellow. Costal spine short but distinct, base of vein R_{4+5} with 1 strong and 1–2 weak setae. Lower calypteres fumose.

Abdomen shiny black, apollinose. T1 + 2 with a pair of weak median marginal bristles, T3 with a pair of strong median marginals. Terminalia with cerci somewhat shorter than surstyli, the latter broad and rounded in profile (Fig. 2). Aedeagus



Figs 1–6. *Ventrops hannemariae* ♂. 1. Head in profile. 2. Cerci + surstyli in lateral view. 3. Cerci + surstyli in posterior view, left surstylus omitted. 4. Aedeagus. 5. Acrophallus in dorsal view. 6. Sternum 5 in ventral view. Scales: Fig. 1: upper scale, Fig. 5: lower scale, other Figs: middle scale.

with the median sclerotisation distinctly extended beyond the phallotreme, with an asymmetrical tip (Figs 4–5).

Length. 5,8 mm.

♀. Unknown.

Material examined. SOUTH AFRICA: *Natal*: Holotype ♂, 20 mi. N. Jozini (2732AC), 28.xi.1971 (M. E. & B. J. Irwin) (NMP). The specimen was caught on a dry hillside at an elevation of 228 m above sea level.

Distribution. South Africa, ? Kenya (see note below).

Note. In addition to the holotype, I have seen a single male from Kenya which fits the description of *V. hannemariae* almost perfectly. This specimen is, however, much smaller, the upper half of the parafacial plate is smooth and shining and without setae, and the palpi are slightly longer than the width of the prementum. Further material is required to decide whether the Kenya specimen is a good species, a geographical variety, or an aberrant product of a restricted larval food source (small host). Data of the specimen are: KENYA: Mt. Elgon Lodge, 1–6.xi.1983 (A. Freidberg) (DZUT), malaise trap.

Ventrops intermedius sp. n.

Fig. 7

Derivation. L. *intermedius* = that is between. The species is named after the size of the eye, which is intermediate between *V. milichioides* and *V. hannemariae*.

Description. ♂. Head black, fronto-orbital plate and parafacial plate with traces of grey pollinosity. Eye enlarged, with concave hind margin (Fig. 7). Ocellars, postocellars, and inner and outer verticals well developed. Fronto-orbital plate with 4 somewhat unequal proclinate and 1 reclinate orbital bristle, and with a few additional hairs in anterior part. Parafacial plate narrow, with distinct setae in a more or less regular row reaching almost to lower eye-margin. Antenna blackish brown, short; third antennomere as long as second. Arista 3,0 × as long as third antennomere, pubescent at base. Vibrissae well developed, situated just at level of lower eye-margin. Gena 0,18 × eye height. Proboscis short, palpi about 2,0 × width of prementum.

Thorax black with trace amounts of grey or olive grey pollinosity. Chaetotaxy as in *V. hannemariae*. Legs with claws of fore tarsi 0,75 × as long as fifth tarsomere. Wings slightly fumose, basicosta brown. Costal spine small but distinct, base of R_{4+5} with 1 strong and 0–1 weak setae. Lower calypteres fumose.

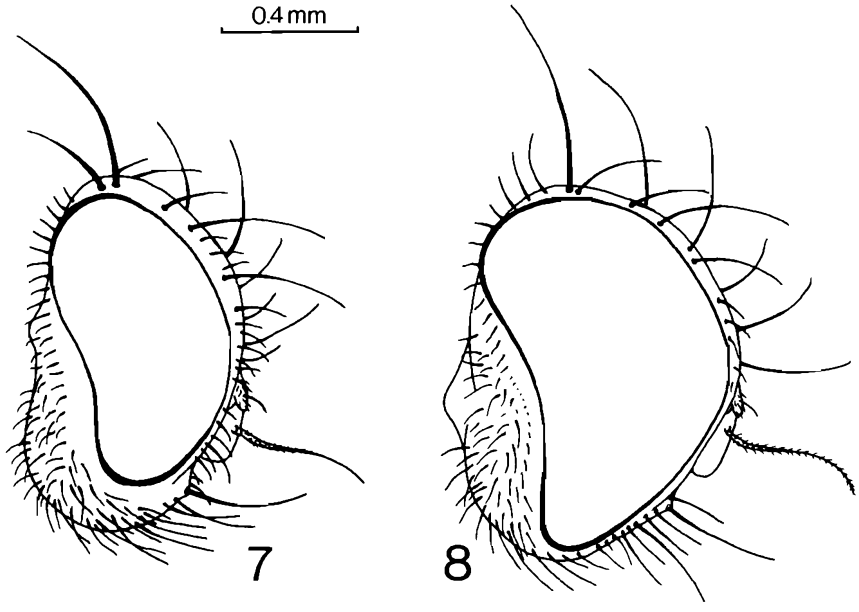
Abdomen shining black, in posterior view with a thin greyish pollinosity on anterior margin of T3–T4. T1 + 2 without median marginal bristles, T3 with a pair of median marginals. Terminalia very similar to those of *V. hannemariae*.

♀. Very like ♂, but with claws of all legs short, and abdomen completely without pollinosity.

Length. 3,3(♂)–3,8 mm (♀).

Material examined. TANZANIA: Holotype ♂ paratype ♀, Uzungwe Mts.,

Mwanihana Forest above Sanje, 1 000 m, 1.viii.1981 (M. Stoltze & N. Scharff) (ZMUC).



Figs 7–8. *Ventrops* spp. ♂. Head profile. 7. *V. intermedius*. 8. *V. incisus*.

Ventrops incisus sp. n.

Figs 8–13

Derivation. L. *incisus* = cut into. The name refers to the shape of the male abdominal sternite 5, which is distinctly incised posteriorly.

Description. In general appearance very like *V. milichioides* (see description in Crosskey 1977:20), and separable only by reference to male ST5 and terminalia (Figs 14–17), as given in key.

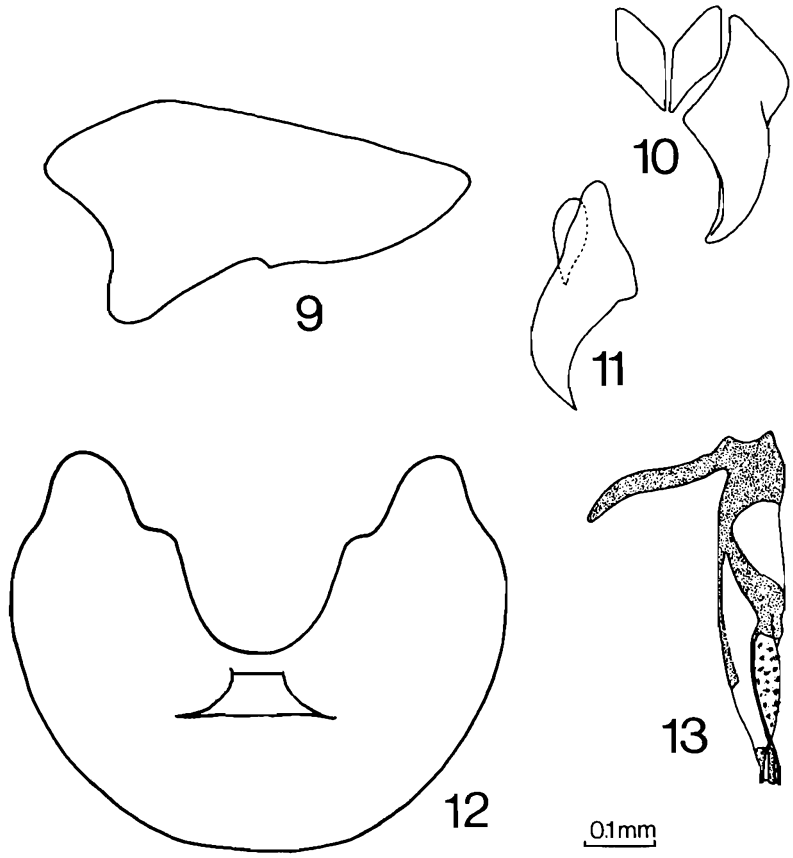
♂. ST5 with posterior margin incised (Figs 9, 12). Cerci very short, more or less rhomboid in posterior view (Fig. 10), and almost concealed between the surstyli (Fig. 11). Aedeagus as in Fig. 13, not differing from that of *V. milichioides*.

♀. At present not distinguishable from females of *V. milichioides*.

Length ♂ ♀. 3,0–3,9 mm.

Material examined. TANZANIA: holotype ♂, East Usambara, Amani, 1 000 m., 25.i.1977 (H. Enghoff, O. Martin & O. Lomholdt) (ZMUC); 3♂ 6♀ paratypes, 22.i.–8.ii.1977, other data as holotype (1♂ 1♀ in NMP others in ZMUC); 2♂ paratypes, Marangu, 9–11.i.1972 (A. Freidberg) (DZUT).

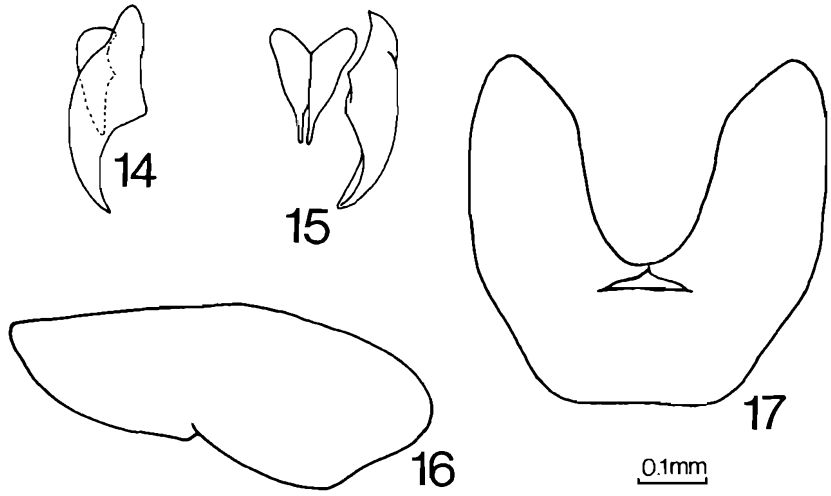
Note. The male paratypes from Tanzania, Marangu, possess fumose lower calypteres while the remaining specimens of the type series (and *V. milichioides*) possess whitish lower calypteres. I have not, however, been able to find any other difference, and so believe all the material to be conspecific.



Figs 9–13. *Ventrops incisus*. ♂. 9. Sternum 5 in lateral view (from the right). 10. Cerci + surstyli in posterior view, left surstylus omitted. 11. Cerci + surstyli in lateral view. 12. Sternum 5 in ventral view. 13. Aedeagus.

PHYLOGENETIC AFFINITIES

With the present addition of three new species, *Ventrops* is no longer monotypic and the question of monophyly becomes of interest. The previously used autapomorphy, the enormously enlarged eyes, is weakened by the inclusion of *V. hannemariae* with eyes of almost normal size. Eye size is, however, still the only autapomorphy corroborating the monophyly of *Ventrops*, but this may be sufficient in the light of *V. intermedius*, which morphologically bridges the gap to the large-eyed species *V. milichioides* and *V. incisus*. This intermediary eye size suggests a closer phylogenetic relation between *V. intermedius* and the two large-eyed species than between *V. intermedius* and *V. hannemariae*, but this hypothesis is strongly contra-indicated by the distiphallic structure. Both *V. intermedius* and *V. hannemariae* possess a highly apomorphic distiphallus with an asymmetrical median sclerotisation, which is distinctly extended beyond the phallotreme (Figs 4–5), whereas the acrophallus of both *V. incisus* and *V. milichioides* is unmodified and plesiomorphic (Fig. 13). A hypothesis of a sister group relation between



Figs 14–17. *Ventrops milichioides* ♂. 14. Cerci + surstyli in lateral view. 15. Cerci + surstyli in posterior view, left surstylus omitted. 16. Sternum 5 in lateral view (from the left). 17. Sternum 5 in ventral view.

V. hannemariae and *V. intermedius* implies that the enlargement of the eyes has evolved independently in *V. intermedius* and in the ancestor of the two large-eyed species *V. incisus* and *V. milichioides*.

Previously only three authors have discussed the possible phylogenetic affinities of *Ventrops*. Crosskey (1977) suggests an affinity between *Ventrops* and *Rhinomorinia* Brauer & Bergenstamm based on similarities in thoracic chaetotaxy, wing venation, and structure of distiphallus. Tschorsnig (1985) delimits a monophyletic group including *Ventrops, Rhinomorinia, Tricogena* Rondani, *Stevenia* Robineau-Desvoidy, *Oplisa* Rondani, and *Acompomintho* Villeneuve based on the apomorphic structure of male terminalia. Pape (1986) depicts *Ventrops* and *Queximyia* Crosskey as equally corroborated sister groups to the '*Rhinomorinia*-group', the latter consisting of the species-rich genus *Rhinomorinia* and the two monotypic genera *Rhinophora* Robineau-Desvoidy and *Melanomyoides* Crosskey which seem closely related, corroborated by their strongly protruding vibrissal angle. The probably plesiomorphic head profile of *V. hannemariae* is interesting as it suggests an entirely different affinity by its striking similarity to *Melanophora* Meigen (and *Bequaertiana* Curran, which may be closely related (Pape 1986)). Other characters of *Ventrops* add to this similarity: The often high number of proclinate orbital bristles and the shiny black and almost apollinose abdomen. Also the aedeagal structure may support a close affinity to *Melanophora*. In the groundplan of the Rhinophoridae, and probably of all the Calyptratae, the aedeagus is equipped with a dorsal sclerotised extension of the basiphallus—the dorsal plate—which distally divides into a pair of dorsolateral processes (terminology as in McAlpine (1981), 'harpes' of Zumpt & Heinz (1950), 'distaler Abschnitt des Paraphallus' of Salzer (1968), 'Fortsätze des Dorsalsklerits' of Tschorsnig (1985)). These processes have become fused into a single dorsomedian sclerotisation in all species of *Ventrops*, and an almost identical condition is found in

Melanophora. A somewhat similar fusion is, however, found in the *Rhinomorinia*-group, and a logical deduction would be to include *Ventrops, Melanophora*, and probably *Bequaertiana* in a monophyletic group corroborated by the number of proclinate orbitals and the recessive vibrissal angle, and to establish the *Rhinomorinia*-group as the probable sister group. There is, however, a single objection to this. The larval morphology of *Melanophora* is very different (see Bedding 1973) from that of *Rhinophora*, and from the sparse information which is available at present, *Melanophora* seems more related to *Phyto* Robineau-Desvoidy and *Paykullia* Robineau-Desvoidy than to *Rhinophora*, while the larval morphology of the latter indicates a closer relationship to *Stevenia* and *Tricogena* than to *Melanophora* (Pape 1986). Important clues to the phylogenetic affinities of *Ventrops* will probably follow from the discovery and description of the first-stage larva, but at present, the arguments discussed above seem in favour of a close affinity between *Ventrops* and *Melanophora*.

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